Chemical Data Quality Assessment

B.1 *Introduction*

A primary goal of the project was to produce a precise, accurate, representative and complete set of quantitative chemical data to prescribed minimum detection levels at the part per million level or below. There are numerous variables that may affect the quality and suitability of chemical data at this level of sensitivity, and a detailed Sampling and Analysis Plan (SAP) was developed to control these variables. Section 2.2 summarizes the design of the Sampling and Analysis Plan that guided the acquisition of data and established the Data Quality Objectives (DQOs) for use of the data to support decisions for this project. DQOs were established in the SAP for data precision, accuracy, representativeness, completeness, comparability and sensitivity. This Appendix presents the results of a systematic check of the analysis results by Altech relative to the project specific DQOs.

B.2 *Quality Control Roles and Responsibilities*

The primary measures to control chemical data quality were implemented by the field sampling team and the laboratory analysts. A three tiered process was conducted to evaluate the data.

B.2.1 Laboratory Analysts

The first tier was by the laboratory analysts for each particular method used, performed at the time of analyses. Each analyst completed and documented the results of:

- Sample custody, labeling-sample login and condition of each sample upon receipt at the lab; extraction and analysis methods;
- Initial and continuing instrument calibration results;
- Spiking of samples with surrogate compounds and matrix and matrix duplicate samples with target compounds;
- Primary field sample analyses and measurement of spike recoveries; and
- Electronic and hard copy results of all primary field and Quality Control (QC) sample analyses.

QC criteria were defined in each method specific Standard Operating Procedure (SOP). Whenever results were outside established criteria, the laboratory analyst promptly implemented corrective actions in accord with the method specific SOPs. This section includes a summary discussion of the analysis results that were outside the method specified control limits and the DQOs for data precision, accuracy, representativeness, completeness, comparability and sensitivity established in the SAP. A complete set of the results of the individual laboratory analysts' quality control analyses for this project are presented in Appendix D.

B.2.2 Laboratory QC Manager

The second tier was performed by the laboratory Quality Control (QC) Manager, who evaluated the batch and sample specific QC analysis results for conformance with the

precision and accuracy criteria for each method specific Standard Operating Procedure. The laboratory QC Manager assessed the primary sample analysis data relative to the supporting QC Analyses results and assigned data qualifiers wherever appropriate. The laboratory QC Manager prepared a case narrative of the analyses describing any out of control results and corrective actions implemented. The complete "Definitive Data Package" provided by Severn Trent Laboratory (STL) is included as Appendix D.

B.3 *Altech Data Quality Assessment*

The third tier of the data quality assessment was an independent QC evaluation of the laboratory data by Altech, which is presented here in Appendix B. This stage included review of the definitive data package of results provided by the STL laboratory, and the project DQOs for data precision, accuracy, representativeness, completeness, comparability and sensitivity. It also included preparation of a summary set of tables (Tables B1 through B15) to aid organization, evaluation and presentation of the results. The Altech data quality assessment included review and evaluation of the complete data package presented in Appendix D for compliance with:

- Sample transport, custody and handling protocol;
- Documentation of extraction dates and analyses within specified holding times;
- Appropriate analytical method application, as scheduled in the SAP;
- Documentation of calibration results;
- Minimum detection levels prescribed in the SAP for each analyte;
- Field sample data results reporting and proper application of data qualifiers; and
- QC criteria for blind duplicate sample results for all analysis parameters.

Tables B-8 through B-10 depict the comparison of blind duplicate sample results, which also helped support calculation and evaluation of conformance to the Data Quality Objectives established for the project.

Appendix D presents the entire STL data report for this project, and it includes extensive calibration data, surrogate recovery, matrix spike and matrix spike duplicate chemical and statistical analyses to document data quality, consistent with the requirements for a "Definitive Data Package," as outlined the USACE "Shell for Analytical Chemistry Requirements." The results of all analyses performed by STL are also summarized in the Tables B-1 through B- 4 (field sediment samples); B-11, B-12, B-14 and B-15 (Rinse Blank and IDW samples).

B.3.1 Sample transport, custody and handling protocol

All samples were delivered by an Altech sampling team to the laboratory in coolers at the end of each day of sampling. A completed chain-of-custody form accompanied the samples, and the laboratory's completed cooler receipt form indicated that all samples arrived properly labeled and containerized. All temperature blanks at the time of receipt indicated temperatures in coolers were within the proper range, with the exception of the cooler received the evening of October 2, 2002. It contained the samples from Management Units 6 and 7. The initial temperature recorded was 9.7° C, but when the cooler was checked the next morning, the temperature was 2.1° C. It appears that there was insufficient time from

sample placement in the cooler to arrival at the laboratory for the temperature to properly cool from ambient.

B.3.2 Documentation of extraction dates and analyses within specified holding times

Tables B-5, B-6 an B-7 depict all dates of sampling, sample preparation and analysis, with the method specific allowable durations between these dates. All Primary and Secondary laboratory analyses were conducted within the required extraction and analysis periods.

As shown in Table 7, all four Tertiary Samples for SVOC Analyses were extracted 27 or 28 days after the date of sampling, which is twice the allowable period of 14 days, then analyzed eight days after extraction, which was within the required analysis period. Upon receipt of the Primary and Secondary Sample results on October 30, Altech Project Manager ordered TPH analyses of Tertiary Samples TS-1, TS-3, TS-5 and TS-10. Tertiary analyses were performed despite being outside allowable holding time as further exercise of due diligence in trying to quantify potential presence of toxic polynuclear aromatic hydrocarbon compounds because 5 out of 26 total Primary and Secondary Samples exceeded residential single sample limit of 200 mg/Kg.

B.3.3 Appropriate analytical method application, as scheduled in the SAP

All Primary, Secondary and Tertiary samples analyzed, were analyzed in accord with the methods specified in the approved SAP.

B.3.4 Documentation of calibration results

Appendix D presents comprehensive results of the initial and continuing calibration analyses for each of the designated laboratory procedures. The results include plots of chromatographs and laboratory analyst notes and documentation of results and calculations. No problems with initial or continuing calibration of instruments were reported for any analysis.

B.3.5 Field sample data results reporting and proper application of data qualifiers

The Laboratory QC Manager followed the method specific Standard Operating Procedures to assign appropriate qualifiers to data. As shown in Tables B-1 though B-4, all non-detect results for all parameters were reported as the reporting limit concentration with a "U" symbol (data qualifier), which indicated that the analyte was not detected. Metals analyses, results below the Reporting Limit concentration yet above the Method Detection Limit were closely evaluated and an estimated concentration result was calculated. Some metals samples were detected at very low concentrations in several method blank samples. A "J" qualifier was assigned to the results for these analytes to indicate that the analyte was also detected in the blank, which indicates the results reported may be biased high. Metal results where an analyte was detected but where the concentration was below the reporting limit were assigned a "B" qualifier, indicating the result provided is the analyst's estimate of the low concentration present.

Similarly, where an organic compound was detected (Methods 8015B, 8270C, 8081A, 8082 and 9023) but below the reporting limit, a "J" qualifier was assigned indicating the result provided is the analyst's estimate of the low concentration present.

B.3.6 QC criteria for blind duplicate sample results for all analysis parameters

Tables B-8 through B-10 present a systematic comparison of all blind duplicate sample results. The results were compared to the criteria in USACE EM 200-1-6, *"Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste Products."* According to this guidance, the results were determined to be either in agreement or disagreement.

For all parameters, if one duplicate sample result was less than the detection limit for the analysis, the other sample result must be 5 times greater than the detection limit for the results to be considered in disagreement and 10 times greater to be considered in major disagreement. Likewise for all parameters, if one sample result was less than the reporting or practical quantitation limit for the analysis, the other sample result must be 3 times greater than the reporting limit to be considered in disagreement and 5 times greater to be considered in major disagreement.

When comparing duplicate sample results for metals, where both samples were determined to have concentrations above the reporting limit, the results were considered in disagreement if one sample is more than double the concentration of the other. They were considered in major disagreement if one is 3 or more times the other. For all other parameters where both duplicate samples were determined to have concentrations above the reporting limit, the results were considered in disagreement if one sample is more than 4 times the concentration of the other. They were considered in major disagreement if one is 5 or more times the other.

B.3.7 Review of Laboratory QC Documentation

As described above, definitive data assessment was initiated at the STL laboratory. The laboratory chemist checked the chain of custody forms, sample handling procedures, analyses requested sample description, labels-unique identification numbers and cooler receipt forms. The laboratory chemist performed initial and continuing calibration of method specific instrumentation using method blank samples, laboratory control and laboratory control duplicate samples. The laboratory method specific quality control for organic analyses methods included spiking field samples with known concentrations of specific surrogate compounds, checking the results and calculating percentage recoveries for compliance with method specific criteria. The laboratory chemist implemented corrective actions as appropriate to maintain proper control of all field sample analyses.

The laboratory QC Manager then checked the actual data, and specifically evaluated extraction and analysis dates relative to sampling dates for compliance with method specific holding time and preservation requirements. The laboratory QC Manager examined the batch specific QC mechanisms for each method, which included evaluation of initial and continuing calibration results, matrix spike and matrix spike duplicate results and surrogate recoveries for conformance with the method specific quality control criteria. To limit analysis costs, no trip blanks or equipment rinse blanks were included for this project.

However laboratory method blank samples were analyzed, and the laboratory QC Manager review included evaluation of these results.

The laboratory chemist and QC Manager data assessment included numerous calculations for the specific data quality indicators of precision and accuracy, and reviews to assure the representativeness, comparability and sensitivity of the data. Altech performed a separate evaluation of all of these parameters, with specific focus toward comparison of the blind duplicate analysis results. The following provides a discussion of the calculation, assessment and review of data quality indicators.

B.4 *Chemical Data Quality Indicator DQO Assessment.*

Data quality was evaluated through a set of qualitative and quantitative analysis techniques. Precision, accuracy, completeness and sensitivity are standard indicators/criteria for data quality that were quantitatively determined. Representativeness and comparability are standard data quality criteria that were qualitatively and/or semi-quantitatively evaluated. Below are the formulas, criteria and calculated results used to measure and assess data quality, both at the laboratory (as shown in Appendix D) and by the Altech QC Manager for the project.

B.4.1 Precision

Precision is defined as a measurement of the closeness of individual test results under prescribed conditions, and it reflects a combination of random and systematic error, as well as natural variation within a specific matrix. A field duplicate (QC) sample was used to assess matrix heterogeneity and field sampling and handling procedures. Laboratory precision was determined through various method specific analyses of calibration standards and laboratory control samples. Analysis of Matrix Spike and Matrix Spike Duplicate (MS/MSD) samples was also used to determine laboratory precision for the specific soil matrices being investigated.

Statistical measures of precision include determination of relative percent difference (RPD), standard deviation (SD) and relative standard deviation (RSD). The RPD for a set of duplicate measurements of variable (X) is defined as:

$$\text{Formula \% RPD} = \left| (X_1 - X_2)/[(X_1 + X_2)/2] \right| * 100\%$$

Where: X_1 = Concentration in replicate 1
X_2 = Concentration in replicate 2

When sufficient replicates were available, such as for continuing calibration analyses, precision can be expressed as the SD or the RSD.

$$SD = \sqrt{[\Sigma (X_i - X)^2 / (n-1)]}$$

$$\% RSD = (SD/Mean) * 100\%$$

The results of MS/MSD precision calculations performed by STL on laboratory duplicate samples are presented in Appendix D. The result of the comparison of the blind field duplicate samples for precision is presented in Tables B-8 through B-10.

The precision acceptability criteria specified in the "Shell for Analytical Chemistry Requirements" were adopted for all analytical methods used for this project. Only data generated within the required precision criteria or otherwise specifically qualified were deemed usable and included in the body of this report. The Laboratory QA Manager, prior to rejecting data as unusable, closely evaluated the data for potential matrix interference and its effects on the results and provided a case narrative of any limitations to the data relative to established control limits for method precision.

The Altech QC Manager for the project closely evaluated the duplicate sample results for precision. As specified in EM 200-1-6, if one duplicate sample result for any parameter was less than the detection limit for the analysis, the other sample result must be 5 times greater than the detection limit for the pair to be considered in disagreement and 10 times greater to be considered in major disagreement. Likewise for all parameters, if one sample result was less than the reporting or practical quantitation limit for the analysis, the other sample result must be 3 times greater than the reporting limit to be considered in disagreement and 5 times greater to be considered in major disagreement.

When comparing duplicate sample results for metals, where both samples were determined to have concentrations above the reporting limit, the results were considered in disagreement if one sample is more than double the concentration of the other.

As shown in Tables B-8 thru B-10, all duplicate sample results were in agreement for all analysis parameters, with one exception. Samples SS-5b and SS-10b were in disagreement for TPH, with the concentration found in SS-10b at nearly four times the concentration found in SS-5b. The data presented in the body of this report meets the established precision criteria and is considered useable for investigation hypothesis testing.

B.4.2 Accuracy

Accuracy measures the bias in a measurement system. Laboratory blanks were used to determine bias or contribution of potential contaminants of concern from various outside sources. Each batch of samples for each method included surrogate spikes, matrix spikes and laboratory control samples to evaluate accuracy. Accuracy for each method of analysis for organic compounds (non-metals) was defined as the percent recovery (%R) of a sample spiked with a known concentration of a specific analyte or group of analytes. Accuracy was primarily determined through the spiking samples with surrogate compounds (compounds not included in the target list of analytes), measuring the concentration of each surrogate in the analysis of each field sample and calculating the percent recovery. Only data generated within the method specific required accuracy criteria was deemed usable. However, the Laboratory QA Manager, prior to rejecting data as unusable, closely evaluated the data for potential matrix interference and its effects on the results.

$$\%R = [(X_s - X_u)/K] * 100\%$$

Where: X_s = Measured Concentration in the Spiked Sample
X_u = Measured Concentration in the Unspiked Sample
K = Known amount of spike in the sample

Tables B-11 and B-12 summarize QC analyses to measure accuracy. While most QC analyses results were within method specified control limits for accuracy, a few were outside established control limits. In several cases, recovery of the TPH surrogate, nonane, was below recovery percentage limits, and method blank contamination was detected in one batch of analyses for TPH. PS-9 was selected as the field sample for matrix spike and matrix spike duplicate analyses for TPH, EOX, Chlordane, PCBs and Chlorides. TPH recoveries in PS-9MS and PS-9MSD were outside (below) control limits. However the RPD between the MS and MSD results were within control limits, and the recovery of the surrogate, nonane, was within control limits for both analyses. All other MS/MSD results were within established control limits.

The data presented in the body of this report meets the established accuracy criteria and is considered useable for investigation hypothesis testing.

B.5 *Representativeness*

Representativeness is a semi-quantitative indicator of data quality. It requires sufficient and proper numbers, frequency, and locations of samples, so as to assure that sample data accurately and precisely represent the selected characteristics of the media sampled. The methods and equipment prescribed in the SAP to collect, store and transport samples were designed to minimize the loss/introduction of target analytes from/into a sample from the point of collection to delivery to the laboratory.

The number and location of Management Units; the number, random location and selected depths of borings; and the types and numbers of samples collected in each Management Unit were designed to provide a statistical basis to evaluate the results. All borings were advanced within close proximity to the location designated, specified depths were achieved, and sufficient volumes were recovered to fill all chemical and geotechnical sample jars specified. The Field Sampling Team Leader documented sampling activities and noted any discrepancies between planned and actual methods of collection, storage and transport of samples. The boring records in Appendix A provide detailed accounts of the field sampling and indicate the procedures specified in the FSP were meticulously followed.

All laboratory methods specified in the SAP were utilized, and the Rinse Blank and Trip Blank sample analysis results indicate that no target analytes were introduced to the samples by way of the sampling, preparation, packaging or transport methods. All Primary and Secondary analyses were conducted within the method prescribed limits. The Tertiary analyses were outside the prescribed holding time limit for SVOCs. While the SVOC analyses were generally within all other specified limits and samples were kept refrigerated, there is potential for loss or breakdown of target compounds. The data is considered representative for qualitative assessment, but because of the potential for loss or breakdown of target compounds, it is not considered suitable for quantitative assessment and investigation hypothesis testing. All of the Primary and Secondary Sample data is considered representative of actual site conditions and is useable for investigation hypothesis testing.

B.6 *Completeness*

Completeness was measured by dividing the number of usable sample results to the total number of sample results. The completeness objective for this project was for 95% of the planned data to be usable (samples collected and analyses generated within the established control limits for precision and accuracy). Completeness was calculated using the following formula:

$$\%C = (V/N) * 100\%$$

Where: V = Number of measurements judged valid
N = Number of valid measurements needed to achieve the specified statistical level of confidence

Completeness was calculated to be 100% of the Primary and Secondary Data.

B.7 *Comparability*

Standardized methods of field analysis, sample collection, holding times, and sample preservation were planned and implemented on this project. No significant deviations from the planned methods of sample collection or prescribed analysis procedures occurred, and the data quality indicator for comparability was achieved, such that observations and conclusions may be directly compared with historical and/or available background data.

B.8 *Sensitivity*

Table B-13 provides a comprehensive list of analytes with the Severn Trent Laboratories (STL) laboratory's target Reporting Limit and Method Detection Limit objectives, which were established in the project specific Sampling and Analysis Plan. The Method Detection Limit is the lowest value, above which, a specific chemical can be identified in the soil at a 95% level of confidence. The Reporting Limit is a higher value, above which, the concentration of a specific chemical in the soil can be quantitatively determined within method prescribed limits for precision and accuracy.

An integral component of the Sampling and Analysis Plan for this project was to assure that quantitation limits for all selected chemical parameters were below 25-50% of the corresponding regulatory criteria for the substance, if practically achievable. All significant discrepancies between target and actual limits of detection and quantitation are described below.

Documented Reporting Limits for TPH varied from 10 to as much as 97 mg/Kg. No non-detect results were reported for TPH, and all analysis results were within appropriate QC criteria for the concentration reported. One sample, PS-7 has a j qualifier, indicating the result is an estimated value, below the practical limits of analysis, 15 mg/Kg.

The target RL for Chlordane was 2 ug/Kg, but was unattainable in any sample analysis. RLs for analyses varied between 18 and 27 ug/Kg. All MDLs were below 2 ug/Kg, and

Chlordane was not detected in any sample. The target RL for individual PCB aroclors was 33 ug/Kg, and actual RLs varied between 34 and 52 ug/Kg. All PCB MDLs were below 13 ug/Kg, and no PCB was detected in any sample.

The laboratory QC Manager evaluated Method Detection and Reporting Limits to assure that minimum detection limits were maintained throughout the analyses, and assigned data qualifiers to estimated concentration data where appropriate. The method detection limits for all analyses were the lowest concentration that an analyte could be detected at a 95% confidence level, but not accurately quantified. The reporting limits for all analyses were the lowest concentration that an analyte could be quantified within method prescribed criteria for precision and accuracy.

In general, the analyses were all conducted to the Method Detection and Reporting Limits prescribed in the Sampling and Analysis Plan, with minor differences between actual and prescribed limits based on differences in soil moisture content. The only appreciable difference between planed and actual Reporting and Detection Limits occurred in the Method 8015B analyses. Actual Reporting Limits were up to 20 times higher for some of the analyses due to variations in moisture content and required dilutions, but were sufficiently below regulatory action levels to allow data use in supporting investigation hypothesis testing.

Table B-1 - North Park and Marshall Lakes Primary Sediment Sample Results

Analytical Parameter	TRPH-DRO (mg/Kg)	EOX (mg/Kg)	Chlordane (ug/Kg)	PCBs (ug/Kg)	Lead (mg/Kg)	Chlorides (mg/Kg)
	Draft Dredging Guideline Limits					
Primary Sample Number	120mg/Kg Unrestricted use - 200 single sample limit residential - 500 single sample non-residential	25 mg/Kg Unrestricted use - 50 single sample limit	20 ug/Kg	1000 ug/Kg	45 mg/Kg	No Standard
PS-1	**130**	<18	<22*	<43	38	91.8
PS-2	83	<16	<20	<39	39.2	52.2
PS-3	**210**	<20	<25*	<48	**49.6**	19.3
PS-4	43	<16	<21*	<41	39.1	83.8
PS-5	**180**	<21	<27*	<52	**66.7**	184
PS-10	**210**	<22	<27*	<52	**63.1**	177
PS-6	23	<18	<21*	<41	25.3	81.8
PS-7	12j	<14	<20	<38	24.9	37.1
PS-8	16	<14	<18	<34	15.8	27.1
PS-9	24	<16	<22*	<42	23.8	80.3
Mean	91.9				38.55	

Table B-2 - North Park Lake Secondary Sediment Sample Results

Secondary Sample Number	TRPH-DRO (mg/Kg)	Lead (mg/Kg)			TRPH-DRO (mg/Kg)	Lead (mg/Kg)
Management Unit 1 PS-1	**130**	38	**Management Unit 5**		**180**	**66.7**
SS-1a	86			SS-5a	160	**72.6**
SS-1b	75			SS-5b	28	**59.3**
SS-1c	71			SS-5c	230	**64.3**
SS-1d	38			SS-5d	84	**78.6**
SS-1 Mean	80		SS-5 Mean		**136.4**	**68.3**
Management Unit 3 PS-3	**210**	**49.6**	**Management Unit 5 Duplicate PS-10**		**210**	**63.1**
SS-3a	90	**55.3**		SS-10a	140	**67.6**
SS-3b	92	**48.9**		SS-10b	110	**60.9**
SS-3c	98	**54.6**		SS-10c	97	**54.3**
SS-3d	30	**70.6**		SS-10d	230	**84.8**
SS-3 Mean	**104**	**55.8**	SS-10 Mean		**157.4**	**66.1**

* Reporting Limit Exceeds required RL, but MDL was 1.1 ug/Kg or less for all analyses.

Bold font indicates result exceeds PADEP Unrestricted Use Criteria: TPH>120 mg/Kg; Lead.45 mg/Kg.

j - Indicates value reported is an estimated value, which is below Reporting Limit for analysis.

Table B-3 - North Park and Marshall Lakes Primary Sediment Sample Metals Analysis Results

Sample ID	PS-1		PS-2		PS-3		PS-4		PS-5		PS-10		PS-6		PS-7		PS-8		PS-9		PADEP	PADEP
STL Sample ID	C2J040308008		C2J080101001		C2J040308001		C2J080243001		C2J040102001		C2J040102008		C2J030104008		C2J030104001		C2J010317001		C2J100102001		Safe Fill	Clean Fill
Matrix	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		Standard	Standard
Units	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	mg/Kg
Metals																						
Aluminum	8260	J	9820	J	10800	J	7900	J	13400	J	12900	J	9990	J	8630	J	7470	J	8630	J	190000	
Antimony	10.4	U	9.5	U	11.6	U	10	U	12.6	U	12.6	U	10	U	9.2	U	8.4	U	10.2	U	27.00	3
Arsenic	7.5		6.9		8.5		8.8		11.7		11.9		8.9		7.5		6.5		7.2		12	0.3
Barium	105		113		128		101		171		167		148		118		86.7		123		8200	500
Beryllium	**1.4**	J	**1.4**	J	**1.5**	J	**1.2**	J	**1.7**	J	**1.8**	J	**1.5**	J	**1.3**	J	**1.1**	J	**1.2**	J	320	**0.1**
Cadmium	0.37	B	0.17	B	0.24	B	0.19	B	0.49	B	0.42	B	0.14	B	0.049	B	0.7	U	0.089	B	38	2
Calcium	3130	J	1910	J	2390	J	1730	J	2740	J	2750	J	1830	J	1420	J	1290	J	1320	J	NS	
Chromium	17.6		16.7		19.7		14.8		22.9		22.5		16.3		17.8		12.9		15		19000	70
Cobalt	10.9		10.8		12.4		9.7		14.2		14		11		10.7		9.5		10.4		24	470
Copper	21.9		18.7		24.1		18.1		29.1		28.7		19		16.3		12.3		14.7		4300	0.05
Iron	23300		23400		27300		22700		32900		33000		26300		26100		21600		24100		66000	
Lead	**38**		**39.2**		**49.6**		**39.1**		**66.7**		**63.1**		**25.3**		**24.9**		**15.8**		**23.8**		450	**20**
Magnesium	2220		2310		2670		1850		3090		3050		2330		2020		1810		2000		NS	
Manganese	**623**		**579**		**741**		**642**		**930**		**948**		**438**		**564**		**609**		**502**		31000	**40**
Mercury	0.087		0.097	J	0.11		0.1	J	0.12		0.12		0.1		0.073		0.043	B	0.055	B	10	2
Nickel	19.9		**20.4**		**23.8**		16.6		**27.9**		**27.5**		**20.8**		18.7		15.7		19.2		650	20
Potassium	481	B	664	B	777	B	405	B	1010	B	914	B	558	B	464	B	460	B	666	B	NS	
Selenium	0.77	B	0.73	B	0.91	B	0.84	U	0.94	B	1.3		0.83	B	0.49	B	0.67	B	0.49	B	26	6
Silver	0.17	B	0.18	B	0.2	B	0.13	B	0.3	B	0.29	B	0.13	B	0.13	B	0.13	B	0.12	B	84	40
Sodium	162	B	91.2	B	213	B	126	B	246	B	261	B	127	B	91.4	B	71	B	146	B	NS	
Thallium	1.7	U	1.6	U	1.9	U	1.7	U	2.1	U	2.1	U	1.7	U	1.5	U	1.4	U	1.7	U	14	0.6
Vanadium	18.5		18.8		20.8		18.2		26.4		26		20.9		17.9		16.3		16.8		1500	
Zinc	**129**	J	**110**	J	**142**	J	98.3	J	**162**	J	**159**	J	92.4	J	82.3	J	52.4	J	85.1	J	7500	100

U	= Non-Detect result. Analyte not detected at Reporting Limit listed.
B	=Estimated result. Result is less than Reporting Limit.
J	= Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Table B-4 - North Park Lake Tertiary Sediment Sample Results

Sample ID	TS-1		TS-3		TS-5		TS-10	
STL Sample ID	C2J300260004		C2J300260003		C2J300260001		C2J300260002	
Location	Boring 1c		Boring 3a		Boring 5d		Boring 5d - Duplicate	
Sample Interval	0' - 9'		0' - 8'		0' - 8'		0' - 8'	
Semi Volatile Organic Compound	ug/Kg		ug/Kg		ug/Kg		ug/Kg	
1,2,4-Trichlorobenzene	540	U	610	U	630	U	680	U
1,2-Dichlorobenzene	540	U	610	U	630	U	680	U
1,3-Dichlorobenzene	540	U	610	U	630	U	680	U
1,4-Dichlorobenzene	540	U	610	U	630	U	680	U
2,2'-oxybis(1-Chloropropane)	540	U	610	U	630	U	680	U
2,4,5-Trichlorophenol	540	U	610	U	630	U	680	U
2,4,6-Trichlorophenol	540	U	610	U	630	U	680	U
2,4-Dichlorophenol	540	U	610	U	630	U	680	U
2,4-Dimethylphenol	540	U	610	U	630	U	680	U
2,4-Dinitrophenol	2600	U	2900	U	3100	U	3300	U
2,4-Dinitrotoluene	540	U	610	U	630	U	680	U
2,6-Dinitrotoluene	540	U	610	U	630	U	680	U
2-Chloronaphthalene	540	U	610	U	630	U	680	U
2-Chlorophenol	540	U	610	U	630	U	680	U
2-Methylnaphthalene	540	U	610	U	630	U	680	U
2-Methylphenol	540	U	610	U	630	U	680	U
2-Nitroaniline	2600	U	2900	U	3100	U	3300	U
2-Nitrophenol	540	U	610	U	630	U	680	U
3,3'-Dichlorobenzidine	2600	U	2900	U	3100	U	3300	U
3-Nitroaniline	2600	U	2900	U	3100	U	3300	U
4,6-Dinitro-2-methylphenol	2600	U	2900	U	3100	U	3300	U
4-Bromophenyl phenyl ether	540	U	610	U	630	U	680	U
4-Chloro-3-methylphenol	540	U	610	U	630	U	680	U
4-Chloroaniline	540	U	610	U	630	U	680	U
4-Chlorophenyl phenyl ether	540	U	610	U	630	U	680	U
4-Methylphenol	540	U	610	U	630	U	680	U
4-Nitroaniline	2600	U	2900	U	3100	U	3300	U
4-Nitrophenol	2600	U	2900	U	3100	U	3300	U
Acenaphthene	540	U	610	U	630	U	680	U
Acenaphthylene	540	U	610	U	630	U	680	U
Anthracene	540	U	610	U	630	U	680	U
Benzo(a)anthracene	540	U	610	U	630	U	680	U
Benzo(a)pyrene	540	U	610	U	630	U	680	U
Benzo(b)fluoranthene	**74**	J	610	U	630	U	680	U
Benzo(ghi)perylene	**51**	J	610	U	630	U	680	U
Benzo(k)fluoranthene	540	U	610	U	630	U	680	U
bis(2-Chloroethoxy)methane	540	U	610	U	630	U	680	U

Table B-4 - North Park Lake Tertiary Sediment Sample Results

Sample ID	TS-1		TS-3		TS-5		TS-10	
STL Sample ID	C2J300260004		C2J300260003		C2J300260001		C2J300260002	
Location	Boring 1c		Boring 3a		Boring 5d		Boring 5d - Duplicate	
Sample Interval	0' - 9'		0' - 8'		0' - 8'		0' - 8'	
Semi Volatile Organic Compound	ug/Kg		ug/Kg		ug/Kg		ug/Kg	
bis(2-Chloroethyl) ether	540	U	610	U	630	U	680	U
bis(2-Ethylhexyl) phthalate	**260**	J	**220**	J	**190**	J	680	U
Butyl benzyl phthalate	540	U	610	U	630	U	680	U
Carbazole	540	U	610	U	630	U	680	U
Chrysene	**55**	J	610	U	630	U	680	U
Di-n-butyl phthalate	**360**	J	**310**	J	**360**	J	**430**	J
Di-n-octyl phthalate	540	U	610	U	630	U	680	U
Dibenz(a,h)anthracene	540	U	610	U	630	U	680	U
Dibenzofuran	540	U	610	U	630	U	680	U
Diethyl phthalate	540	U	610	U	630	U	680	U
Dimethyl phthalate	540	U	610	U	630	U	680	U
Fluoranthene	**98**	J	610	U	630	U	680	U
Fluorene	540	U	610	U	630	U	680	U
Hexachlorobenzene	540	U	610	U	630	U	680	U
Hexachlorobutadiene	540	U	610	U	630	U	680	U
Hexachlorocyclopentadiene	2600	U	2900	U	3100	U	3300	U
Hexachloroethane	540	U	610	U	630	U	680	U
Indeno(1,2,3-cd)pyrene	**48**	J	610	U	630	U	680	U
Isophorone	540	U	610	U	630	U	680	U
N-Nitrosodi-n-propylamine	540	U	610	U	630	U	680	U
N-Nitrosodiphenylamine	540	U	610	U	630	U	680	U
Naphthalene	540	U	610	U	630	U	680	U
Nitrobenzene	540	U	610	U	630	U	680	U
Pentachlorophenol	2600	U	2900	U	3100	U	3300	U
Phenanthrene	**52**	J	610	U	630	U	680	U
Phenol	540	U	610	U	630	U	680	U
Pyrene	**71**	J	610	U	630	U	680	U
Surrogate Recovery Percentages								
2,4,6-Tribromophenol	0.99	*	34	*	46		53	
2-Fluorobiphenyl	76		74		73		72	
2-Fluorophenol	3.6	*	41		44		55	
Nitrobenzene-d5	74		72		70		70	
Phenol-d5	23	*	56		59		63	
Terphenyl-d14	63		65		82		80	

NOTE: Tertiary Sample Analyses for SemiVolatile Organic Compounds were performed outside Method required holding time.

U - Indicates analyte was not detected.

J - Indicates value reported is an estimated value, which is below Reporting Limit for analysis.

* - Inicates result is outside control limits for analysis.

Bold font inicates detected analyte.

Table B-5 - Comparison of Actual to Allowed Duration Between Sampling, Extraction and Analysis of Primary Samples

Primary Sample Number (1)	Sample Date / Allowable Duration	TPH Preparation/ Analysis Date / 14/40 days	EOX Preparation /Analysis Date / 28 days	Chlordane Preparation /Analysis Date / 14/40 days	PCB Preparation/ Analysis Date / 14/40 days	Metals Preparation/ Analysis Date / 6 months	Chlorides Preparation /Analysis Date / 28 days
PS-1	4-Oct-02	5-Oct-02	9-Oct-02	7-Oct-02	7-Oct-02	10-Oct-02	23-Oct-02
		8-Oct-02	9-Oct-02	8-Oct-02	8-Oct-02	11-Oct-02	26-Oct-02
Actual Duration		1/3 days	5 days	3/1 days	3/1 days	7 days	22 days
DQO Comparison		OK	OK	OK	OK	OK	OK
PS-2	7-Oct-02	9-Oct-02	10-Oct-02	10-Oct-02	10-Oct-02	10-Oct-02	23-Oct-02
		11-Oct-02	10-Oct-02	14-Oct-02	14-Oct-02	11-Oct-02	26-Oct-02
Actual Duration		2/2 days	3 days	3/4 days	3/4 days	4 days	19 days
DQO Comparison		OK	OK	OK	OK	OK	OK
PS-3	4-Oct-02	5-Oct-02	9-Oct-02	7-Oct-02	7-Oct-02	10-Oct-02	23-Oct-02
		8-Oct-02	9-Oct-02	8-Oct-02	8-Oct-02	11-Oct-02	26-Oct-02
Actual Duration		1/3 days	5 days	3/1 days	3/1 days	7 days	22 days
DQO Comparison		OK	OK	OK	OK	OK	OK
PS-4	8-Oct-02	9-Oct-02	10-Oct-02	10-Oct-02	10-Oct-02	10-Oct-02	23-Oct-02
		11-Oct-02	10-Oct-02	14-Oct-02	14-Oct-02	11-Oct-02	26-Oct-02
Actual Duration		1/2 days	2 days	2/4 days	2/4 days	3 days	18 days
DQO Comparison		OK	OK	OK	OK	OK	OK
PS-5	3-Oct-02	5-Oct-02	9-Oct-02	7-Oct-02	7-Oct-02	10-Oct-02	23-Oct-02
		8-Oct-02	9-Oct-02	8-Oct-02	8-Oct-02	11-Oct-02	26-Oct-02
Actual Duration		2/3 days	6 days	4/1 days	4/1 days	8 days	23 days
DQO Comparison		OK	OK	OK	OK	OK	OK
PS-10	3-Oct-02	5-Oct-02	9-Oct-02	7-Oct-02	7-Oct-02	10-Oct-02	23-Oct-02
		8-Oct-02	9-Oct-02	8-Oct-02	8-Oct-02	11-Oct-02	26-Oct-02
Actual Duration		2/3 days	6 days	4/1 days	4/1 days	8 days	23 days
DQO Comparison		OK	OK	OK	OK	OK	OK
PS-6	2-Oct-02	4-Oct-02	9-Oct-02	7-Oct-02	7-Oct-02	10-Oct-02	23-Oct-02
		7-Oct-02	9-Oct-02	8-Oct-02	8-Oct-02	11-Oct-02	26-Oct-02
Actual Duration		2/3 days	7 days	5/1 days	5/1 days	9 days	24 days
DQO Comparison		OK	OK	OK	OK	OK	OK
PS-7	2-Oct-02	4-Oct-02	9-Oct-02	7-Oct-02	7-Oct-02	10-Oct-02	23-Oct-02
		7-Oct-02	9-Oct-02	8-Oct-02	8-Oct-02	11-Oct-02	26-Oct-02
Actual Duration		2/3 days	7 days	5/1 days	5/1 days	9 days	24 days
DQO Comparison		OK	OK	OK	OK	OK	OK
PS-8	1-Oct-02	2-Oct-02	8-Oct-02	7-Oct-02	7-Oct-02	10-Oct-02	23-Oct-02
		3-Oct-02	8-Oct-02	8-Oct-02	8-Oct-02	11-Oct-02	26-Oct-02
Actual Duration		1/1 days	7 days	6/1 days	6/1 days	10 days	25 days
DQO Comparison		OK	OK	OK	OK	OK	OK
PS-9	9-Oct-02	16-Oct-02	14-Oct-02	10-Oct-02	10-Oct-02	10-Oct-02	23-Oct-02
		17-Oct-02	14-Oct-02	14-Oct-02	14-Oct-02	11-Oct-02	26-Oct-02
Actual Duration		7/1 days	5 days	1/4 days	1/4 days	2 days	17 days
DQO Comparison		OK	OK	OK	OK	OK	OK

Table B-6 - Comparison of Actual to Allowed Duration Between Sampling, Extraction and Analysis of Secondary Samples

Secondary Sample Number (2)	Sample Date	TPH Preparation/ Analysis Date	Actual Duration	DQO Comparison	Metals Preparation/ Analysis Date	Duration	DQO Comparison
	Allowable Duration	14/40 days			6 months		
SS-1a	4-Oct-02	10-Oct-02	6 days	OK			
		14-Oct-02	4 days	OK			
SS-1b	4-Oct-02	10-Oct-02	6 days	OK			
		14-Oct-02	4 days	OK			
SS-1c	4-Oct-02	10-Oct-02	6 days	OK			
		14-Oct-02	4 days	OK			
SS-1d	4-Oct-02	10-Oct-02	6 days	OK			
		14-Oct-02	4 days	OK			
SS-3a	4-Oct-02	10-Oct-02	6 days	OK	18-Oct-02		
		14-Oct-02	4 days	OK	19-Oct-02	15 days	OK
SS-3b	4-Oct-02	10-Oct-02	6 days	OK	18-Oct-02		
		15-Oct-02	5 days	OK	19-Oct-02	15 days	OK
SS-3c	4-Oct-02	10-Oct-02	6 days	OK	18-Oct-02		
		15-Oct-02	5 days	OK	19-Oct-02	15 days	OK
SS-3d	4-Oct-02	16-Oct-02	12 days	OK	18-Oct-02		
		17-Oct-02	1 days	OK	19-Oct-02	15 days	OK
SS-5a	3-Oct-02	10-Oct-02	7 days	OK	18-Oct-02		
		14-Oct-02	4 days	OK	19-Oct-02	16 days	OK
SS-5b	3-Oct-02	16-Oct-02	13 days	OK	18-Oct-02		
		17-Oct-02	1 days	OK	19-Oct-02	16 days	OK
SS-5c	3-Oct-02	10-Oct-02	7 days	OK	18-Oct-02		
		14-Oct-02	4 days	OK	19-Oct-02	16 days	OK
SS-5d	3-Oct-02	16-Oct-02	13 days	OK	18-Oct-02		
		17-Oct-02	1 days	OK	19-Oct-02	16 days	OK
SS-10a	3-Oct-02	10-Oct-02	7 days	OK	18-Oct-02		
		14-Oct-02	4 days	OK	19-Oct-02	16 days	OK
SS-10b	3-Oct-02	10-Oct-02	7 days	OK	18-Oct-02		
		14-Oct-02	4 days	OK	19-Oct-02	16 days	OK
SS-10c	3-Oct-02	10-Oct-02	7 days	OK	18-Oct-02		
		14-Oct-02	4 days	OK	19-Oct-02	16 days	OK
SS-10d	3-Oct-02	10-Oct-02	7 days	OK	18-Oct-02		
		14-Oct-02	4 days	OK	19-Oct-02	16 days	OK

Table B-7 - Comparison of Actual to Allowed Duration Between Sampling, Extraction and Analysis of Tertiary Samples

Tertiary Sample Number (3)	Sample Date	SVOC Preparation/Analysis	Actual	DQO Comparison
		Allowable = 14/40 days		
TS-1 AD-1c	4-Oct-02	31-Oct-02	**27 days**	**13 days over**
		8-Nov-02	9 days	OK
TS-3 AD 3a	4-Oct-02	31-Oct-02	**27 days**	**13 days over**
		8-Nov-02	9 days	OK
TS-5 AD-5d	3-Oct-02	31-Oct-02	**28 days**	**14 days over**
		8-Nov-02	9 days	OK
TS-10 AD 5d split	3-Oct-02	31-Oct-02	**28 days**	**14 days over**
		8-Nov-02	9 days	OK
NOTE: Bold font indicates excedence of Method Specific QC criteria				

Table B-8 - North Park Lake QC Comparison of Split Duplicate Primary and Secondary Sample Results

Analytical Parameter	TRPH-DRO (mg/Kg)	EOX (mg/Kg)	Chlordane (ug/Kg)	PCBs (ug/Kg)	Lead (mg/Kg)	Chlorides (mg/Kg)
	Draft Dredging Guideline Limits					
	120mg/Kg Unrestricted use - 200 single sample limit residential - 500 single sample non-residential	25 mg/Kg Unrestricted use - 50 single sample limit	20 ug/Kg	1000 ug/Kg	45 mg/Kg	No Standard
DQO Criteria	<3x difference	<4x difference	<4x difference	<4x difference	<2x difference	<4x difference
Sample Number						
PS-5	**180**	<21	<27*	<52	**66.7**	184
PS-10	**210**	<22	<27*	<52	**63.1**	177
RPD	15.38%	ND	ND	ND	5.55%	3.88%
Ratio	1.167				0.946	0.962
Comparison	Agreement				Agreement	Agreement
SS-5a	160				**72.6**	
SS-10a	**140**				**67.6**	
RPD	13.33%				7.13%	
Ratio	0.875				0.931	
Comparison	Agreement				Agreement	
SS-5b	28				**59.3**	
SS-10b	**110**				**60.9**	
RPD	118.84%				2.66%	
Ratio	**3.929**				1.027	
Comparison	Disagreement				Agreement	
SS-5c	230				**64.3**	
SS-10c	**97**				**54.3**	
RPD	81.35%				16.86%	
Ratio	0.422				0.844	
Comparison	Agreement				Agreement	
SS-5d	84				**78.6**	
SS-10d	**230**				**84.8**	
RPD	92.99%				7.59%	
Ratio	2.738				1.079	
Comparison	Agreement				Agreement	

* Reporting Limit Exceeds required RL, but MDL was 1.1 ug/Kg or less for all analyses.

Bold font indicates result exceeds PADEP Unrestricted Use Criteria or QO QC Criteria

J - Indicates value reported is an estimated value, which is below Reporting Limit for analysis.

Table B-9 - North Park Lake QC Comparison of Split Duplicate Primary Metal Sample Results

Sample ID	PS-5		PS-10		PS-5	PS-10		PADEP	PADEP	Ratio	DQO
STL Sample ID	C2J040102001		C2J040102008		C2J040102001	C2J040102008		Safe Fill	Clean Fill	PS-10	Criteria
Matrix	SOLID		SOLID		SOLID	SOLID	Relative %	Standard	Standard	PS-5	< 2x difference
Units	mg/Kg		mg/Kg		mg/Kg	mg/Kg	Difference	mg/Kg	mg/Kg		
Metals											
Aluminum	13400	J	12900	J	13400	12900	3.8%	190000		0.963	Agreement
Antimony	12.6	U	12.6	U	12.6	12.6	0.0%	27.00	3	1.000	Agreement
Arsenic	11.7		11.9		11.7	11.9	1.7%	12	0.3	1.017	Agreement
Barium	171		167		171	167	2.4%	8200	500	0.977	Agreement
Beryllium	**1.7**	J	**1.8**	J	**1.7**	**1.8**	5.7%	320	**0.1**	1.059	Agreement
Cadmium	0.49	B	0.42	B	0.49	0.42	15.4%	38	2	0.857	Agreement
Calcium	2740	J	2750	J	2740	2750	0.4%	NS		1.004	Agreement
Chromium	22.9		22.5		22.9	22.5	1.8%	19000	70	0.983	Agreement
Cobalt	14.2		14		14.2	14	1.4%	24	470	0.986	Agreement
Copper	29.1		28.7		29.1	28.7	1.4%	4300	0.05	0.986	Agreement
Iron	32900		33000		32900	33000	0.3%	66000		1.003	Agreement
Lead	**66.7**		**63.1**		**66.7**	**63.1**	5.5%	450	**20**	0.946	Agreement
Magnesium	3090		3050		3090	3050	1.3%	NS		0.987	Agreement
Manganese	**930**		**948**		**930**	**948**	1.9%	31000	**40**	1.019	Agreement
Mercury	0.12		0.12		0.12	0.12	0.0%	10	2	1.000	Agreement
Nickel	**27.9**		**27.5**		**27.9**	**27.5**	1.4%	650	20	0.986	Agreement
Potassium	1010	B	914	B	1010	914	10.0%	NS		0.905	Agreement
Selenium	0.94	B	1.3		0.94	1.3	32.1%	26	6	1.383	Agreement
Silver	0.3	B	0.29	B	0.3	0.29	3.4%	84	40	0.967	Agreement
Sodium	246	B	261	B	246	261	5.9%	NS		1.061	Agreement
Thallium	2.1	U	2.1	U	2.1	2.1	0.0%	14	0.6	1.000	Agreement
Vanadium	26.4		26		26.4	26	1.5%	1500		0.985	Agreement
Zinc	**162**	J	**159**	J	**162**	**159**	1.9%	7500	100	0.981	Agreement

U	= Non-Detect result. Analyte not detected at Reporting Limit listed.
B	=Estimated result. Result is less than Reporting Limit.
J	= Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Table B-10 - North Park Lake QC Comparison of Tertiary Split Duplicate Sample Results

Sample ID	TS-5		TS-10		TS-5	TS-10	Ratio	DQO Criteria
STL Sample ID	C2J300260001		C2J300260002		C2J300260001	C2J300260002	PS-10	
Location	Boring 5d		Boring 5d - Duplicate		Boring 5d	Boring 5d - Duplicate	PS-5	< 5x difference
Sample Interval	0' - 8'		0' - 8'		0' - 8'	0' - 8'		
Semi Volatile Organic Compound	ug/Kg		ug/Kg		ug/Kg	ug/Kg		
1,2,4-Trichlorobenzene	630	U	680	U	630	680	1.079	Agreement
1,2-Dichlorobenzene	630	U	680	U	630	680	1.079	Agreement
1,3-Dichlorobenzene	630	U	680	U	630	680	1.079	Agreement
1,4-Dichlorobenzene	630	U	680	U	630	680	1.079	Agreement
2,2'-oxybis(1-Chloropropane)	630	U	680	U	630	680	1.079	Agreement
2,4,5-Trichlorophenol	630	U	680	U	630	680	1.079	Agreement
2,4,6-Trichlorophenol	630	U	680	U	630	680	1.079	Agreement
2,4-Dichlorophenol	630	U	680	U	630	680	1.079	Agreement
2,4-Dimethylphenol	630	U	680	U	630	680	1.079	Agreement
2,4-Dinitrophenol	3100	U	3300	U	3100	3300	1.065	Agreement
2,4-Dinitrotoluene	630	U	680	U	630	680	1.079	Agreement
2,6-Dinitrotoluene	630	U	680	U	630	680	1.079	Agreement
2-Chloronaphthalene	630	U	680	U	630	680	1.079	Agreement
2-Chlorophenol	630	U	680	U	630	680	1.079	Agreement
2-Methylnaphthalene	630	U	680	U	630	680	1.079	Agreement
2-Methylphenol	630	U	680	U	630	680	1.079	Agreement
2-Nitroaniline	3100	U	3300	U	3100	3300	1.065	Agreement
2-Nitrophenol	630	U	680	U	630	680	1.079	Agreement
3,3'-Dichlorobenzidine	3100	U	3300	U	3100	3300	1.065	Agreement
3-Nitroaniline	3100	U	3300	U	3100	3300	1.065	Agreement
4,6-Dinitro-2-methylphenol	3100	U	3300	U	3100	3300	1.065	Agreement
4-Bromophenyl phenyl ether	630	U	680	U	630	680	1.079	Agreement
4-Chloro-3-methylphenol	630	U	680	U	630	680	1.079	Agreement
4-Chloroaniline	630	U	680	U	630	680	1.079	Agreement
4-Chlorophenyl phenyl ether	630	U	680	U	630	680	1.079	Agreement
4-Methylphenol	630	U	680	U	630	680	1.079	Agreement
4-Nitroaniline	3100	U	3300	U	3100	3300	1.065	Agreement
4-Nitrophenol	3100	U	3300	U	3100	3300	1.065	Agreement
Acenaphthene	630	U	680	U	630	680	1.079	Agreement
Acenaphthylene	630	U	680	U	630	680	1.079	Agreement
Anthracene	630	U	680	U	630	680	1.079	Agreement
Benzo(a)anthracene	630	U	680	U	630	680	1.079	Agreement
Benzo(a)pyrene	630	U	680	U	630	680	1.079	Agreement
Benzo(b)fluoranthene	630	U	680	U	630	680	1.079	Agreement
Benzo(ghi)perylene	630	U	680	U	630	680	1.079	Agreement
Benzo(k)fluoranthene	630	U	680	U	630	680	1.079	Agreement

Table B-10 - North Park Lake QC Comparison of Tertiary Split Duplicate Sample Results

Sample ID	TS-5		TS-10		TS-5	TS-10	Ratio	DQO Criteria
STL Sample ID	C2J300260001		C2J300260002		C2J300260001	C2J300260002	PS-10	
Location	Boring 5d		Boring 5d - Duplicate		Boring 5d	Boring 5d - Duplicate	PS-5	< 5x difference
Sample Interval	0' - 8'		0' - 8'		0' - 8'	0' - 8'		
Semi Volatile Organic Compound	ug/Kg		ug/Kg		ug/Kg	ug/Kg		
bis(2-Chloroethoxy)methane	630	U	680	U	630	680	1.079	Agreement
bis(2-Chloroethyl) ether	630	U	680	U	630	680	1.079	Agreement
bis(2-Ethylhexyl) phthalate	**190**	J	680	U	**190**	680	3.579	Agreement
Butyl benzyl phthalate	630	U	680	U	630	680	1.079	Agreement
Carbazole	630	U	680	U	630	680	1.079	Agreement
Chrysene	630	U	680	U	630	680	1.079	Agreement
Di-n-butyl phthalate	**360**	J	**430**	J	**360**	**430**	1.194	Agreement
Di-n-octyl phthalate	630	U	680	U	630	680	1.079	Agreement
Dibenz(a,h)anthracene	630	U	680	U	630	680	1.079	Agreement
Dibenzofuran	630	U	680	U	630	680	1.079	Agreement
Diethyl phthalate	630	U	680	U	630	680	1.079	Agreement
Dimethyl phthalate	630	U	680	U	630	680	1.079	Agreement
Fluoranthene	630	U	680	U	630	680	1.079	Agreement
Fluorene	630	U	680	U	630	680	1.079	Agreement
Hexachlorobenzene	630	U	680	U	630	680	1.079	Agreement
Hexachlorobutadiene	630	U	680	U	630	680	1.079	Agreement
Hexachlorocyclopentadiene	3100	U	3300	U	3100	3300	1.065	Agreement
Hexachloroethane	630	U	680	U	630	680	1.079	Agreement
Indeno(1,2,3-cd)pyrene	630	U	680	U	630	680	1.079	Agreement
Isophorone	630	U	680	U	630	680	1.079	Agreement
N-Nitrosodi-n-propylamine	630	U	680	U	630	680	1.079	Agreement
N-Nitrosodiphenylamine	630	U	680	U	630	680	1.079	Agreement
Naphthalene	630	U	680	U	630	680	1.079	Agreement
Nitrobenzene	630	U	680	U	630	680	1.079	Agreement
Pentachlorophenol	3100	U	3300	U	3100	3300	1.065	Agreement
Phenanthrene	630	U	680	U	630	680	1.079	Agreement
Phenol	630	U	680	U	630	680	1.079	Agreement
Pyrene	630	U	680	U	630	680	1.079	Agreement
Surrogate Recovery Percentages								
2,4,6-Tribromophenol	46		53					
2-Fluorobiphenyl	73		72					
2-Fluorophenol	44		55					
Nitrobenzene-d5	70		70					
Phenol-d5	59		63					
Terphenyl-d14	82		80					

NOTE: Tertiary Sample Analyses for SemiVolatile Organic Compounds were performed outside Method required holding time.

U - Indicates analyte was not detected.

J - Indicates value reported is an estimated value, which is below Reporting Limit for analysis.

* - Inicates result is outside control limits for analysis.

Bold font indicates detected analyte.

Table B-11 - North Park Lake PaDEP Parameters QC and Investigation Derive Waste Sample Results

	RB-1	DR-1 (IDW)		PS-9 MS	PS-9 MSD	Recovery Limits	RPD	RPD Limits
TPH (as Diesel) (ug/L)	<100	<100		33% a	39% a	(70-130)	4.3	(0-50)
Surrogate Recoveries								
C9 (nonane)	32%	0.071 % *	0.97 % *	21%	18%	(10-110)		
EOX (ug/L)	<30	<30		72.44%	72.12%		0.66	
Chlordane (technical) ug/L	<0.5	<0.5						
Surrogate Recoveries								
Decachlorobiphenyl	92%	92%						
Tetrachloro-m-xylene	88%	80%						
PCBs (ug/L)	**RB-1**	**DR-1 (IDW)**		**PS-9 MS**	**PS-9 MSD**	**Recovery Limits**	**RPD**	**RPD Limits**
Aroclor 1016	<1	<1		75%	76%	(26-144)	0.67	(0-39)
Aroclor 1221	<1	<1						
Aroclor 1232	<1	<1						
Aroclor 1242	<1	<1						
Aroclor 1248	<1	<1						
Aroclor 1254	<1	<1						
Aroclor 1260	<1	<1		86%	87%	(37-138)	1.8	(0-33)
Surrogate Recoveries								
Decachlorobiphenyl	86%	87%						
Tetrachloro-m-xylene	74%	75%						
	RB-1	**DR-1 (IDW)**		**PS-9 MS**	**PS-9 MSD**	**Recovery Limits**	**RPD**	**RPD Limits**
Chlorides (mg/L)	<1	111		104%	106%	(75-125)	1.8	(0-20)

* The surrogate recovery of nonane was below the control limits for DR-1. The sample was reextracted outside the holding, and the surrogate recovery was again outside control limits, confirming interference.

a The matrix spike and the matrix spike duplicate were outside control limits, and the Relative Percent Difference between the samples was within control limits.

Table B-12 - North Park Lake Metal QC and IDW Sample Results

Sample ID	PS-9			PS-9			RB-1		RB-1			RB-1			DR-1	
STL Sample ID	C2J100102001			C2J100102001			C2J100103001		C2J100103001			C2J100103001			C2J100103002	
Type	MS			MSD			Rinse Blank		MS			MSD			IDW	
Matrix	SOLID			SOLID			WATER		WATER			WATER			WATER	
Units							ug/L								ug/L	
Metals																
Aluminum		NC	%		N	%	112	B J	97		%	98		%	416000	J
Antimony	56	N	%	53	N	%	60	U	95		%	96		%	300	U
Arsenic	88		%	85		%	10	U	95		%	96		%	254	
Barium	96		%	93		%	1.5	B	99		%	100		%	5540	
Beryllium	92		%	90		%	1.4	B J	94		%	95		%	42	J
Cadmium	86		%	85		%	5	U	92		%	93		%	7.5	B
Calcium	94		%	91		%	88.4	B	93		%	94		%	138000	
Chromium	105		%	109		%	1.8	B	94		%	95		%	649	
Cobalt	90		%	88		%	50	U	91		%	92		%	387	
Copper	101		%	97		%	25	U	100		%	101		%	732	
Iron		NC	%		N	%	208		85		%	87		%	1240000	
Lead	91		%	86		%	3	U	94		%	94		%	1620	
Magnesium	98		%	98		%	5000	U	95		%	96		%	86300	
Manganese		NC	%		N	%	6.4	B	92		%	93		%	47100	
Mercury	101		%	96		%	2.7								0.2	U
Nickel	93		%	92		%	40	U	93		%	93		%	701	
Potassium	90		%	92		%	49.2	B	104		%	106		%	54100	
Selenium	83		%	82		%	5	U	94		%	95		%	37.9	
Silver	92		%	90		%	10	U	99		%	100		%	2.7	B
Sodium	87		%	86		%	744	B J	94		%	96		%	732000	J
Thallium	87		%	86		%	10	U	95		%	96		%	104	
Vanadium	102		%	101		%	50	U	98		%	98		%	1110	
Zinc	106		%	104		%	6.8	B	103		%	110		%	5660	

NC	= Recovery and/or relative Percent Difference not calculated.
N	= Spiked analyte recovery is outside stated control limits.
U	= Non-Detect result. Analyte not detected at Reporting Limit listed.
B	=Estimated result. Result is less than Reporting Limit.
J	= Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Table B-13 - Comparison of Regulatory Criteria to Laboratory Quantitation and Detection Limits

USEPA SW846 Analytical Method	Chemical	CAS #	PaDEP Dredging Guideline		Safe Fill (mg/kg)	Clean Fill (mg/kg)	RL (mg/kg)	MDL (mg/kg)
			Unrestricted Use	Single Sample Limit				
TPH								
8015B	TPH (as Diesel)		120 ppm	200 ppm resid.		Total of 50	0.100 NS	0.039 NS
8015B				500 ppm non-res.			0.010 NS	0.003 NS
EOX								
	Extractable Organic Halides		25 ppm	50 ppm				
PCB's								
8082	AROCLOR-1016	12674112	Total PCB 1 ppm	Total PCB 1 ppm	15.00		0.033	0.005
8082	AROCLOR-1221	11104282			0.62		0.033	0.002
8082	AROCLOR-1232	11141165			0.52		0.033	0.008
8082	AROCLOR-1242	53469219			16.00		0.033	0.005
8082	AROCLOR-1248	12672296			9.90		0.033	0.004
8082	AROCLOR-1254	11097691			4.40		0.033	0.002
8082	AROCLOR-1260	11096825			30.00		0.033	0.005
Metals								
6020/7000	ARSENIC	7440382			12	0.3	0.500	0.010
6020/7000	THALLIUM	7440280			14	0.6	0.100	0.003
6010B/7000	ALUMINUM	7429905					20.00 NS	1.170 NS
6010B/7001	ANTIMONY	7440360			27	3	1.00	0.385
6010B/7002	BARIUM	7440393			8,200	500	20.00	0.111
6010B/7003	BERYLLIUM	7440417			320	0.1	0.500	0.047
6010B/7004	CADMIUM	7440439			38	2	0.500	0.024
6010B/7006	CALCIUM	7440702					500.00 NS	5.572 NS
6010B/7007	CHROMIUM III	16065831			190, 000		1.00	0.107
	Total Chromium					70		
6010B/7009	COBALT	7440484			24	470	5.00	0.166
6010B/7010	COPPER	7440508			4,300	100	2.50	0.113
6010B/7011	**IRON	7439896					10.00 NS	3.262 NS
6010B/7012	LEAD	7439921	45 ppm*	450 ppm (non) res	450	20	0.300	0.231
6010B/7013	MAGNESIUM	7439954					500.00 NS	2.179 NS
6010B/7014	MANGANESE	7439965			31,000	40	1.50	0.045
6010B/7016	NICKEL	7440020			650	20	4.00	0.178
6010B/7017	POTASSIUM	7440097100					500.00 NS	4.554 NS
6010B/7018	SELENIUM	7782492			26	6	0.500	0.275
6010B/7019	SILVER	7440224			84	40	1.000	0.065
6010B/7020	SODIUM	7440235					500.00 NS	23.510 NS
6010B/7021	VANADIUM	7440622			1500		5.00	0.217
6010B/7022	ZINC	7440666			7500	100	2.00	0.441
6010B/7023	MERCURY (INORGANIC)	7439976			10	2	0.100	0.009
Volatile Organic Compounds (VOCs)								
8260B	ACETONE	67641			41.00	0.003	0.020	0.005
8260B	BENZENE	71432			0.13	0.05	0.005	0.002
8260B	BROMODICHLOROMETHANE	75274			3.40	1	0.005	0.001
8260B	BROMOFORM	75252			4.30	0.103	0.005	0.001
8260B	BROMOMETHANE	74839			0.54	0.1	0.010	0.004
8260B	METHYL ETHYL KETONE (2-BUTANONE)	78933			53.00	0.005	0.020	0.001
8260B	CARBON DISULFIDE	75150			160.00	0.08	0.005	0.002
8260B	CARBON TETRACHLORIDE	56235			0.26	0.05	0.005	0.003
8260B	CHLOROBENZENE	108907			3.40	0.3	0.005	0.001
8260B	DIBROMOCHLOROMETHANE	124481			3.20		0.005	0.001

Table B-13 - Comparison of Regulatory Criteria to Laboratory Quantitation and Detection Limits

USEPA SW846 Analytical Method	Chemical	CAS #	PaDEP Dredging Guideline		Safe Fill (mg/kg)	Clean Fill (mg/kg)	RL (mg/kg)	MDL (mg/kg)
			Unrestricted Use	Single Sample Limit				
8260B	CHLOROETHANE	75003			~~5.00~~		0.010	0.002
8260B	CHLOROFORM	67663			2.50	0.05	0.005	0.001
8260B	**CHLOROMETHANE	74873			0.04	0.03	0.010	0.001
8260B	1,1-DICHLOROETHANE	75343			0.65	0.05	0.005	0.002
8260B	1,2-DICHLOROETHANE	107062			0.10	0.03	0.005	0.001
8260B	1,1-DICHLOROETHENE	75354			0.19	0.07	0.005	0.002
8260B	CIS-1,2-DICHLOROETHENE	156592			1.60	0.7	0.005	0.002
8260B	TRANS-1,2-DICHLOROETHENE	156605			2.30	0.06	0.005	0.002
8260B	1,2-DICHLOROPROPANE	78875			0.11	0.05	0.005	0.001
8260B	1,3-DICHLOROPROPENE	542756			0.013		0.005	0.001
8260B	ETHYLBENZENE	100414			46.00	0.5	0.005	0.001
8260B	2-HEXANONE	591786					0.020 NS	0.001 NS
8260B	METHYLENE CHLORIDE	75092			0.08	0.02	0.005	0.002
8260B	METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	108101			2.90		0.020	0.001
8260B	STYRENE	100425			24.00	1	0.005	0.001
8260B	1,1,1,2-TETRACHLOROETHANE	630206			0.78	0.4	0.005	0.001
8260B	TETRACHLOROETHENE	127184			0.43	0.05	0.005	0.002
8260B	TOLUENE	108883			44.00	0.2	0.005	0.002
8260B	1,1,1-TRICHLOROETHANE	71556			7.20	0.1	0.005	0.002
8260B	1,1,2-TRICHLOROETHANE	79005			0.15	0.05	0.005	0.001
8260B	TRICHLOROETHENE	79016			0.17	0.05	0.005	0.002
8260B	VINYL CHLORIDE	75014			0.27	0.02	0.010	0.002
8260B	XYLENES	1330207			850.00	0.3	0.015	0.004
8260B	MTBE	1634044			0.28	0.02	0.005	0.002
Chlordane								
	Chlordane	57-74-9	< = 20 ppb		49.00	0.02		
Chloride								
	Chloride				250			
Semi-Volatile Organic Compounds (SVOC's)								
8270C	ACENAPHTHENE	83329			2700.00	3.00	0.330	0.026
8270C	ACENAPTHYLENE	208968			2500.00		0.330	0.030
8270C	ANTHRACENE	120127			350.00	7.00	0.330	0.032
8270C	BENZ[A]ANTHRACENE	56553			25.00	0.1	0.330	0.033
8270C	BENZO[B]FLUORANTHENE	205992			25.00	0.6	0.330	0.045
8270C	BENZO[K]FLUORANTHENE	207089			250.00	6	0.330	0.043
8270C	BENZO(GHI)PERYLENE	191242			180.00	3	0.330	0.029
8270C	BENZO[A]PYRENE	50328			2.50	0.002	0.330	0.030
8270C	BIS(2-CHLOROETHOXY)METHANE	111911					0.330 NS	0.037 NS
8270C	BIS(2-CHLOROETHYL)ETHER	111444			0.00		0.330 #	0.038 #
8270C	BIS(2-ETHYLHEXYL)PHTHALATE	117817			130.0	0.06	0.330	0.032
8270C	4-BROMOPHENYL PHENYL ETHER	101553					0.330 NS	0.027 NS
8270C	CARBAZOLE	86748			0.37		0.330	0.029
8270C	4-CHLOROANILINE	106478			19.00		0.330	0.022
8270C	4-CHLORO-3-METHYLPHENOL	59507			37.00		0.330	0.028
8270C	2-CHLORONAPHTHALENE	91587			6200.00		0.330	0.030
8270C	2-CHLOROPHENOL	95578			4.40	0.4	0.330	0.057
8270C	4-CHLOROPHENYL PHENYL ETHER	7005723					0.330 NS	0.023 NS
8270C	CHRYSENE	218019			230.00	50.00	0.330	0.032

Table B-13 - Comparison of Regulatory Criteria to Laboratory Quantitation and Detection Limits

USEPA SW846 Analytical Method	Chemical	CAS #	PaDEP Dredging Guideline		Safe Fill (mg/kg)	Clean Fill (mg/kg)	RL (mg/kg)	MDL (mg/kg)
			Unrestricted Use	Single Sample Limit				
8270C	DIBENZ[A,H]ANTHRACENE	53703			2.50		0.330	0.022
8270C	DIBENZOFURAN	132649				3	0.330 NS	0.031 NS
8270C	DIBUTYLPHTHALATE	84742			1500.00		0.330	0.030
8270C	**1,2-DICHLOROBENZENE	95501			60.00	0.7	0.330	0.046
8270C	1,3-DICHLOROBENZENE	541731			60.00		0.330	0.039
8270C	1,4-DICHLOROBENZENE	106467			10.00	0.7	0.330	0.023
8270C	3,3'-DICHLOROBENZIDINE	91941			8.40		1.600	0.020
8270C	2,4-DICHLOROPHENOL	120832			1.00	0.2	0.330	0.035
8270C	DIETHYLPHTHALATE	84662			160.00	0.3	0.330	0.030
8270C	2,4-DIMETHYLPHENOL	105679			31.00		0.330	0.029
8270C	DIMETHYLPHTHALATE	131113				0.06	0.330 NS	0.027 NS
8270C	**4,6-DINITRO-2-METHYLPHENOL	534521					1.600 NS	0.021 NS
8270C	2,4-DINITROPHENOL	51285			0.21		1.600 #	0.498 #
8270C	2,4-DINITROTOLUENE	121142			0.05	0.0005	0.330 #	0.030
8270C	2,6-DINITROTOLUENE	606202			1.10	0.0005	0.330	0.025
8270C	DIOCTYLPHTHALATE	117840			4400		0.330	0.029
8270C	FLUORANTHENE	206440			3300.00	40	0.330	0.031
8270C	FLUORENE	86737			380.00	4	0.330	0.029
8270C	HEXACHLOROBENZENE	118741			0.96	0.01	0.330	0.027
8270C	HEXACHLOROBUTADIENE	87683			1.20	0.01	0.330	0.045
8270C	**HEXACHLORO - CYCLOPENTADIENE	77474			91.00	0.5	1.600	0.022
8270C	HEXACHLOROETHANE	67721			0.56	0.01	0.330	0.046
8270C	INDENO[1,2,3-C,D]PYRENE	193395			25.0	0.6	0.330	0.023
8270C	ISOPHORONE	78591			1.9	1	0.330	0.043
8270C	2-METHYLNAPHTHALENE	91576			2900.00	2	0.330	0.034
8270C	2-METHYLPHENOL	108394			20		0.330	0.049
8270C	4-METHYLPHENOL	106445			2	0.04	0.330	0.074
8270C	NAPHTHALENE	91203			5.00	0.2	0.330	0.034
8270C	2-NITROANILINE	88744			0.04		1.600 #	0.031
8270C	3-NITROANALINE						1.600 NS	0.031 NS
8270C	4-NITROANALINE						1.600 NS	0.019 NS
8270C	NITROBENZENE	98953			0.79		0.330	0.041
8270C	2-NITROPHENOL	88755			5.90		0.330	0.045
8270C	4-NITROPHENOL	100027			4.20	0.05	1.600	0.023
8270C	N-NITROSODIPHENYLAMINE	86306			20.00		0.330	0.037
8270C	N-NITROSODI-N-PROPYLAMINE	621647			0.0013	0.03	0.330 #	0.033 #
8270C	2,2'-OXYBIS(1-CHLOROPROPANE)	108601			8.00		0.330	0.054
8270C	PENTACHLOROPHENOL	87865			5.00	0.01	1.600	0.023
8270C	PHENANTHRENE	85018			10000.00	8	0.330	0.032
8270C	PHENOL	108952			66.00	0.02	0.330	0.036
8270C	PYRENE	129000			2200.00	30	0.330	0.036
8270C	1,2,4-TRICHLOROBENZENE	120821			28.00	0.7	0.330	0.035
8270C	2,4,5-TRICHLOROPHENOL	95954			2300.00		0.330	0.032
8270C	2,4,6-TRICHLOROPHENOL	88062			17.00		0.330	0.023

* = TCLP Leachate lead must be less than 5.0 mg/l. The soil to groundwater pathway is 450 mg/kg and is the most stringent standard.

1 = PQLs are from PaDEP published Clean Fill Standard. Where clean fill levels are lower than the PQLs, the PQL is the standard.

= The Safe Fill Standard is below the RL provided by the laboratory.

Unadjusted RL and MDL values, final RL and MDL values will be adjusted for moisture and dilutions

NS = No Standard

Table B-14 - North Park Lake Volatile Organic Compound QC and IDW Sample Results

Sample ID	RB-1			DR-1			TRIP BLANK		
STL Sample ID	C2J100103001			C2J100103002			C2J100103003		
Type	EQUIPMENT RINSE BLANK			IDW			Water Blank		
Matrix	WATER			WATER			WATER		
Volatile Organic Compound									
1,1,1-Trichloroethane	5	U	ug/L	5	U	ug/L	5	U	ug/L
1,1,2,2-Tetrachloroethane	5	U	ug/L	5	U	ug/L	5	U	ug/L
1,1,2-Trichloroethane	5	U	ug/L	5	U	ug/L	5	U	ug/L
1,1-Dichloroethane	5	U	ug/L	5	U	ug/L	5	U	ug/L
1,1-Dichloroethene	5	U	ug/L	5	U	ug/L	5	U	ug/L
1,2-Dichloroethane	5	U	ug/L	5	U	ug/L	5	U	ug/L
1,2-Dichloroethene (total)	5	U	ug/L	5	U	ug/L	5	U	ug/L
1,2-Dichloropropane	5	U	ug/L	5	U	ug/L	5	U	ug/L
2-Butanone	20	U	ug/L	20	U	ug/L	20	U	ug/L
2-Hexanone	20	U	ug/L	20	U	ug/L	20	U	ug/L
4-Methyl-2-pentanone	20	U	ug/L	20	U	ug/L	20	U	ug/L
Acetone	20	U	ug/L	**13**	J	ug/L	20	U	ug/L
Benzene	5	U	ug/L	5	U	ug/L	5	U	ug/L
Bromodichloromethane	5	U	ug/L	5	U	ug/L	5	U	ug/L
Bromoform	5	U	ug/L	5	U	ug/L	5	U	ug/L
Bromomethane	10	U	ug/L	10	U	ug/L	10	U	ug/L
Carbon disulfide	5	U	ug/L	5	U	ug/L	5	U	ug/L
Carbon tetrachloride	5	U	ug/L	5	U	ug/L	5	U	ug/L
Chlorobenzene	5	U	ug/L	5	U	ug/L	5	U	ug/L
Chloroethane	10	U	ug/L	10	U	ug/L	10	U	ug/L
Chloroform	5	U	ug/L	5	U	ug/L	5	U	ug/L
Chloromethane	10	U	ug/L	**53**		ug/L	10	U	ug/L
cis-1,3-Dichloropropene	5	U	ug/L	5	U	ug/L	5	U	ug/L
Dibromochloromethane	5	U	ug/L	5	U	ug/L	5	U	ug/L
Ethylbenzene	5	U	ug/L	5	U	ug/L	5	U	ug/L
Methylene chloride	5	U	ug/L	5	U	ug/L	5	U	ug/L
Styrene	5	U	ug/L	5	U	ug/L	5	U	ug/L
Tetrachloroethene	5	U	ug/L	5	U	ug/L	5	U	ug/L
Toluene	5	U	ug/L	5	U	ug/L	5	U	ug/L
trans-1,3-Dichloropropene	5	U	ug/L	5	U	ug/L	5	U	ug/L
Trichloroethene	5	U	ug/L	5	U	ug/L	5	U	ug/L
Vinyl chloride	10	U	ug/L	10	U	ug/L	10	U	ug/L
Xylenes (total)	5	U	ug/L	5	U	ug/L	5	U	ug/L
Surrogate Recoveries									
1,2-Dichloroethane-d4	92		%	111		%	91		%
4-Bromofluorobenzene	98		%	92		%	98		%
Dibromofluoromethane	101		%	103		%	98		%
Toluene-d8	95		%	89		%	95		%

Bold font inicates detected analyte.

U - Indicates analyte was not detected.

J - Indicates value reported is an estimated value, which is below Reporting Limit for analysis.

Table B-15 - North Park Lake Semi-Volatile Organic Compound QC and IDW Sample Results

Sample ID	RB-1		DR-1		TS-5			TS-5		
STL Sample ID	C2J100103001		C2J100103002		C2J300260001			C2J300260001		
Type	Rinse Blank		IDW		MS			MSD		
Matrix	WATER		WATER		SOLID			SOLID		
Semi Volatile Organic Compound	ug/L		ug/L							
1,2,4-Trichlorobenzene	9.5	U	49	U	80		%	79		%
1,2-Dichlorobenzene	9.5	U	49	U						
1,3-Dichlorobenzene	9.5	U	49	U						
1,4-Dichlorobenzene	9.5	U	49	U	75		%	73		%
2,2'-oxybis(1-Chloropropane)	9.5	U	49	U						
2,4,5-Trichlorophenol	9.5	U	49	U						
2,4,6-Trichlorophenol	9.5	U	49	U						
2,4-Dichlorophenol	9.5	U	49	U						
2,4-Dimethylphenol	9.5	U	49	U						
2,4-Dinitrophenol	48	U	240	U						
2,4-Dinitrotoluene	9.5	U	49	U	82		%	81		%
2,6-Dinitrotoluene	9.5	U	49	U						
2-Chloronaphthalene	9.5	U	49	U						
2-Chlorophenol	9.5	U	49	U	73		%	71		%
2-Methylnaphthalene	9.5	U	49	U						
2-Methylphenol	9.5	U	49	U						
2-Nitroaniline	48	U	240	U						
2-Nitrophenol	9.5	U	49	U						
3,3'-Dichlorobenzidine	48	U	240	U						
3-Nitroaniline	48	U	240	U						
4,6-Dinitro-2-methylphenol	48	U	240	U						
4-Bromophenyl phenyl ether	9.5	U	49	U						
4-Chloro-3-methylphenol	9.5	U	49	U	68		%	67		%
4-Chloroaniline	9.5	U	49	U						
4-Chlorophenyl phenyl ether	9.5	U	49	U						
4-Methylphenol	9.5	U	49	U						
4-Nitroaniline	48	U	240	U						
4-Nitrophenol	48	U	240	U	73		%	71		%
Acenaphthene	9.5	U	49	U	80		%	78		%
Acenaphthylene	9.5	U	49	U						
Anthracene	9.5	U	49	U						
Benzo(a)anthracene	9.5	U	49	U						
Benzo(a)pyrene	9.5	U	49	U						
Benzo(b)fluoranthene	9.5	U	49	U						
Benzo(ghi)perylene	9.5	U	49	U						
Benzo(k)fluoranthene	9.5	U	49	U						
bis(2-Chloroethoxy)methane	9.5	U	49	U						

Table B-15 - North Park Lake Semi-Volatile Organic Compound QC and IDW Sample Results

Sample ID	RB-1		DR-1		TS-5			TS-5		
STL Sample ID	C2J100103001		C2J100103002		C2J300260001			C2J300260001		
Type	Rinse Blank		IDW		MS			MSD		
Matrix	WATER		WATER		SOLID			SOLID		
Semi Volatile Organic Compound	ug/L		ug/L							
bis(2-Chloroethyl) ether	9.5	U	49	U						
bis(2-Ethylhexyl) phthalate	**4.5**	J	**290**							
Butyl benzyl phthalate	9.5	U	49	U						
Carbazole	9.5	U	49	U						
Chrysene	9.5	U	49	U						
Di-n-butyl phthalate	9.5	U	49	U						
Di-n-octyl phthalate	9.5	U	49	U						
Dibenz(a,h)anthracene	9.5	U	49	U						
Dibenzofuran	9.5	U	49	U						
Diethyl phthalate	9.5	U	49	U						
Dimethyl phthalate	9.5	U	49	U						
Fluoranthene	9.5	U	49	U						
Fluorene	9.5	U	49	U						
Hexachlorobenzene	9.5	U	49	U						
Hexachlorobutadiene	9.5	U	49	U						
Hexachlorocyclopentadiene	48	U	240	U						
Hexachloroethane	9.5	U	49	U						
Indeno(1,2,3-cd)pyrene	9.5	U	49	U						
Isophorone	9.5	U	49	U						
N-Nitrosodi-n-propylamine	9.5	U	49	U	57		%	56		%
N-Nitrosodiphenylamine	9.5	U	49	U						
Naphthalene	9.5	U	49	U						
Nitrobenzene	9.5	U	49	U						
Pentachlorophenol	48	U	240	U	79		%	76		%
Phenanthrene	9.5	U	49	U						
Phenol	9.5	U	**120**		71		%	67		%
Pyrene	9.5	U	49	U	84		%	80		%
Surrogate Recoveries										
2,4,6-Tribromophenol	57		29		73		%	72		%
2-Fluorobiphenyl	59		24	*	82		%	80		%
2-Fluorophenol	57		59		63		%	62		%
Nitrobenzene-d5	65		55		78		%	77		%
Phenol-d5	59		62		67		%	66		%
Terphenyl-d14	74		20		81		%	78		%

Bold font inicates detected analyte.

U - Indicates analyte was not detected.

J - Indicates value reported is an estimated value, which is below Reporting Limit for analysis.

* - Indicates result is outside control limits for analysis.